STATE OF COLORADO

OFFICE OF THE STATE ENGINEER
Division of Water Resources
Department of Natural Resources

1313 Sherman Street, Room 818
Denver, Colorado 80203
Phone: (303) 866-3581
FAX: (303) 866-3589

http://water.state.co.us/default.htm

June 30, 1999

Bill Owens
Governor

Greg E. Walcher
Executive Director

Hal D. Simpson, P.E.
State Engineer

Mr. Kenneth S. Cooper
Deputy District Engineer
Department of the Army
Corps of Engineers, Omaha District
215 North 17th Street
Omaha, NE 68102-4978

RE: Response to questions regarding the Cherry Creek Dam Safety Study, Environmental Impact Statement, your letter dated June 11, 1999

Dear Mr. Cooper:

Thank you for the opportunity to clarify the Colorado Division of Water Resources requirements and policies as they relate to the Corps of Engineers (COE) Cherry Creek Dam Safety study and Environmental Impact Statement. Specifically regarding the site-specific probable maximum precipitation (PMP) study and associated hydrologic analysis. I have organized my response to correspond to your questions a through i to avoid restatement of the questions. I first would like to thank the COE for the open coordination and honest discussions with me regarding the Cherry Creek Dam issues since 1976 and with others in this office prior to my involvement. I am mindful that any limited explanation and discussion provided here may require additional information at a later date and welcome the opportunity to discuss these items with your staff at their convenience.

a) The Cherry Creek Dam spillway currently meets the capacity requirements of the State of Colorado Rules and Regulations for Dam safety and Dam Construction for Class I high hazard dams. Therefor, the State of Colorado does not require the COE to provide a study and analysis of the spillway. We generally support any owner improving the safety of their dams and require review and approval of the design for future modifications, if any. We would not require any additional review of the site-specific studies performed by the National Weather Service (NWS). We do require as part of our design review of site-specific precipitation studies by an approved third party, the review performed by Mr. John T. Riedel would meet this requirement.

b) We have performed no studies to develop an inflow value for Cherry Creek Dam. In 1990 our staff performed a cursory review of a COE hydrologic study. Our review evaluated basin parameters used as input values for a hydrologic analysis program in use by the COE staff at that time. Our review considered the precipitation indices, infiltration rate, and unit hydrograph and found them to be reasonable. We have also reviewed the data used for the current inflow projections, and consider them to also be reasonable. We would like to note that an analysis by our staff would utilize basin parameters considered to be more conservative, and thus may result in an inflow greater than the current inflow developed by the COE.

c) The State of Colorado Rules and Regulations for Dam Safety and Construction (Rules) requires that existing Class I, high hazard dams constructed prior to 1988 be capable of safely routing the flood which would result from 75% of the probable maximum precipitation (PMP). The spillway at Cherry Creek Dam has been found to be acceptable under our Rules, based upon the 1990 COE analysis. The COE decision to protect Cherry Creek Dam to a higher standard, capable of passing or controlling 100% of the PMF, is acceptable, we do not restrict owners from prudent application of more conservative designs.

d) The Rules require construction of Class I dams after 1988 to safely control and /or route a flood resulting from 100% of the PMP, this requirement is equivalent to routing the probable maximum flood (PMF).

e) The Colorado Department of Natural Resources through the Division of Water Resources (DWR) and the Colorado Water Conservation Board have entered into a contract with Colorado state University (CSU) to for "The Development of New Methodologies for Determining Extreme Precipitation", Phase II and III of an ongoing study. Dr. William R. Cotton is the Principle investigator for CSU and Mr. Alan Pearson the project manager for DWR. CSU is to evaluate extreme precipitation at high elevation. Phase I of this study was initiated in 1995 in response to uncertainty regarding the magnitude of precipitation at high elevations above 7,500 feet and evidence that HMR 55A generalized indices may be too high based upon paleo-flood studies. This study is focused on precipitation above elevation 7500 feet, with some consideration for lower elevation basins to avoid discontinuity of index values. This study is not for the purpose of evaluating extreme precipitation in the Cherry Creek basin.

f) The State of Colorado has received site-specific studies associated with the following dams: Williams Fork, Elkhead, Ritschard, Grizzly, Mason, Great Western, and South Platte. Enclosed are copies of Great Western and South Platte studies submitted to this office. The remaining site-specific studies submitted for consideration for basins above elevation 7500 feet and are available if necessary.

g) The selected infiltration rate of 0.5"/hour is the accepted upper boundary for soils of a pervious nature, or SCS hydrologic group A, as presented in the USBR's Hydrology Manual. We note that the Cherry Creek basin is not predominately soil group A, suggesting that this infiltration rate may be high. While it exceeds acceptable values under our policies, it does not appear unreasonable based upon observed response to historic storms. Use of a higher value would require additional analysis and evaluation.

h) The Rules do not require the use of an antecedent storm, but rather the use of minimum infiltration rates. This condition simulates the effects of previous storms. The COE use of an antecedent storm is viewed as an internal COE policy; we have no specific concerns regarding your policy.

i) The Rules do not require design for residual freeboard. This was the result of considering the probability of the simultaneous occurrence of extreme rain and wind. We do not have any specific concerns with the policy of the COE with regard to this criterion.

Thank you for the opportunity to provide clarification regarding these items. If you require additional information, please contact me at (303) 866-3581.

Sincerely,

Jack G. Byers
Assistant State Engineer

cc: Greg Hammer